

## Griffin visits Dryden

■ **New administrator shares his philosophies**

**By Jay Levine**  
X-Press Editor

NASA's new administrator, Michael Griffin, held a May 24 town hall meeting at Dryden in which he introduced himself to employees and fielded questions about his philosophy and vision for the Agency.



Michael Griffin

In keeping with goals laid out in 2004 by President George Bush, Griffin said NASA's chief focus will be on returning the Space Shuttles safely to flight and retiring the orbiters by 2010. Other priorities include completing the International Space Station, developing a replacement for the Space Shuttles and engaging in missions to return to the Moon and eventually begin human exploration of Mars.

In the short term, Griffin said restructuring of the aeronautics directorate will continue.

"There are some dislocations and there will be some pain associated with that. We will bear it together," he said.

But while streamlining of operations and personnel will continue into the next fiscal year, he said he also wants to see congressional and Agency leaders develop a vision for aeronautics that could lead to eventual rebuilding of the first 'A' in 'NASA.' Once the right skill mix is achieved and a cohesive vision for aeronautics is outlined, Griffin said he sees aeronautics research growing with renewed vigor.

In the national debate on a direction and focus for aeronautics, Griffin said one area to which

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ED05 0082-03

NASA Photo by Tom Tschida

With Dryden's assistance, the Altair uninhabited air vehicle recently completed a series of missions for the National Oceanic and Atmospheric Administration.

## Altair effort scores win for NASA/NOAA team

**By Jay Levine**  
X-Press Editor

A series of science missions conducted in May with the Altair uninhabited air vehicle marked the first UAV collaboration by Dryden and

the National Oceanic and Atmospheric Administration.

Dryden assisted NOAA with lease of the Altair aircraft, built by General Atomics Aeronautical Systems Inc. of San Diego, and provided instrumentation for a series

of atmospheric and oceanic research flights off the California coastline.

Dryden Mission Manager Chris Jennison said the mission had many

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## Fullerton joins Hall of Fame

**By Roberta Ross**  
Public Affairs Specialist

Dryden chief research pilot and former astronaut C. Gordon Fullerton was inducted April 30 into the U.S. Astronaut Hall of Fame at the Kennedy Space Center Visitor Complex in Florida.

Fullerton was joined by two other 2005 candidates, Joseph Allen and Bruce McCandless. A committee of former NASA officials and flight controllers, journalists, historians and Hall of Fame astronauts selected the trio.



ED05 0095-2

NASA Photo

Dryden chief pilot and former astronaut C. Gordon Fullerton, left, is welcomed into the Astronaut Hall of Fame by retired astronaut Fred Haise. In the background is Vance Brand, former astronaut and Dryden's deputy director of programs.

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# Center Director's column

## Good progress made in transformation

We all recognize that NASA is undergoing major change. For Dryden, this has meant reductions in the NASA aeronautics budget, the consequent need to draw down staffing and the necessity for refocusing operations to accommodate these changes. We all are working to adjust to this transformation process and will continue to do so for the foreseeable future. All the solutions to these issues are not yet entirely clear or in place.

But we are making good progress in our transformation efforts, and I want to share with you some good news. First, in the area of compliance with required reductions in staffing, we are doing better than expected. We had a goal of reducing Civil Service workforce levels from 565 full-time equivalents, or FTEs in fiscal year 2005 to 514 FTEs for FY2006. With buyouts and people who have found employment elsewhere, we already project a figure of about 500 FTEs, including temporary employees, by the end of the current fiscal year, well ahead of our goal for FY2006. In the process, we lost a great deal of valuable experience, but this presents great opportunities for other people to take on roles that have been vacated.

Second, with the help of many people here, Dryden's program planning office and others have done a magnificent job of finding new work for the Center. For several years through FY2003, the level of reimbursable work at Dryden had been about \$3 million annually. In FY2004, that level rose to about \$12 million. It more than doubled to roughly \$25 million this year, and we expect it to rise to over \$30 million in FY2006. This reimbursable work will help offset civil servant and contractor costs and allow a more gradual realignment of our workforce skills and capacity. Barring the unforeseen, this should



Center Director  
Kevin L. Petersen

eliminate any need for forced workforce reductions.

For the short term, the picture for onsite contractors is somewhat mixed. We will need to continue to

reduce some contract jobs to meet our institutional restructuring goals. But if reimbursable work continues to increase, as projected, it will provide additional funding for civil servants and contractors, support staff as well as engineers and technicians.

It is important to note that this good news must be tempered by realism. If NASA should have to enact further reductions, we may have to go back to the drawing board. But as far as I can tell at the moment, we may avoid any worst-case scenarios. We still need to reduce overhead and other costs to make us more competitive for new business, but as so many did with reimbursable work, a lot of people seem to be pitching in. We also must pay close attention to the way we approach our work, shifting staffing to meet requirements and prioritizing so people are not overworked. We also are seeking to enable people whose skills may not fit into future projections of Center needs to transition into new career fields.

Despite such requirements, it appears that we are moving in the right direction. Some time ago, we shifted some of our focus to unpiloted aerial vehicles. This has paid off and we currently have several UAV technology

efforts underway. In addition, NASA's Vehicle Systems program includes sonic boom mitigation, with prospects for flights with the F/A-18 and F-15. There also is the prospect that a low-sonic-boom demonstrator will be built and flown here. We expect to get autonomous aerial refueling demonstration, or AARD work with the Defense Advanced Research Projects Agency and to work with the Department of Homeland Security on a Propulsion Control for Aircraft Recovery System.

In addition, some UAV work with the National Oceanic and Atmospheric Administration may help to answer questions about global warming and other issues. And prospects look good for our participation in the Exploration Systems efforts to realize the vision for space exploration. These projects are only some of those we anticipate in the coming months and years.

Many people contributed to the increase in reimbursable work. For example, Gerard Schkolnik had a big hand in bringing the AARD project to Dryden. John Carter and Robert Curry did a great job of bringing about the PCARS effort with the Department of Homeland Security. In the flight loads lab, Larry Hudson and Thomas Horn demonstrated an entrepreneurial spirit by helping to arrange the recently completed, successful loads testing of the U.S. Navy E-2C Hawkeye, a project that may bring other, similar work to the Center.

All these are examples of ways in which many of you have contributed to a positive transformation of the way we do business at Dryden. With your help, we can continue turning a difficult transition period in Dryden's history into another success story.

## Dryden X-43A team represented at Aviation Week's Laurel Awards

By David E. Steitz/Doc Mirelson  
NASA Headquarters Public Affairs

Two members of Dryden's X-43A flight research project team attended ceremonies April 5 in which the X-43A/Hyper-X project team and several of its major players were honored by Aviation Week and Space Technology in the publication's 48th annual Laurel Awards program at the National Air and Space Museum in Washington, D.C.

Laurel honorees were nominated by the editors of the aerospace magazine for "extraordinary individual and team accomplishments in the global aviation, aerospace and defense industries."

The Laureates Hall of Fame Award in Aeronautics/Propulsion went to Hyper-X Program Manager Vince Rausch and supersonic-combustion ramjet engine developer Randall Volland, both of Langley Research Center, Hampton, Va. The award also cited Anthony Castrogiovanni, president of ATK-GASL of Tullahoma, Tenn., co-designers of the X-43A's engine, and the entire X-43/Hyper-X scramjet team "for their completion of the first two free flights of an operating scramjet engine integrated with a representative hypersonic airframe."

The two flights from Dryden, in March and November 2004, set world



EC000-222-2

NASA Photo

Catherine Bahm, left, and Laurie Marshall Grindle, X-43A deputy chief engineer and chief engineer for flight three, respectively, represented Dryden at a recent award ceremony. In the center is J. Victor Lebacqz, NASA associate administrator for Aeronautics.

speed records for aircraft powered by a non-rocket, air-breathing engine, the first near Mach 7 (seven times the speed of sound) and the second at almost Mach 10.

Dryden aerodynamics engineer Laurie Marshall Grindle and controls engineer Catherine Bahm, chief engineer and deputy chief engineer, respectively, for the final X-43A

flight, represented the Dryden X-43 project team at the awards presentation.

Another of NASA's aeronautics efforts, the Synthetic Vision Systems, or SVS, project, was among five honored in the Information Technology/Electronics award category. The project

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## News at NASA

### DC-8 part of new NASA agreement

NASA has signed a cooperative agreement with the University of North Dakota, Grand Forks, to house and operate the Agency's DC-8 jet aircraft. The purpose of the agreement is to create a National Suborbital Education and Research Center at the university with the DC-8 suborbital laboratory as the centerpiece.

The agreement is intended to expand the science conducted using the DC-8 and enhance hands-on educational opportunities for students. The agreement is valued at \$25 million over a five-year period. Transfer of the aircraft to the university is targeted for fall 2005, pending completion of a safety review. The aircraft will be housed at the Grand Forks Air Force Base.

### Rover escapes Mars sand trap

NASA's Mars Exploration Rover mission engineers and managers cheered when images from the Martian surface confirmed that rover Opportunity successfully escaped from a sand trap.

From about 108 million miles away, the rover team at NASA's Jet Propulsion Laboratory, Pasadena, Calif., had worked diligently for nearly five weeks to extricate the rover. The long-distance roadside assistance was a painstaking operation undertaken to free the six-wheeled rover, which was mired in the soft sand of a small Martian dune.

### NASA chooses 23 new projects

NASA's Science mission directorate has selected 23 projects that will harness Earth science data to improve decision-making processes. NASA will contribute approximately \$22 million over the three-year life of these projects with national organizations that include water management, public health, air quality, ecosystem stewardship and disaster management.

"These projects were chosen for their leadership in the use of Earth science observation and model predictions," said NASA's Deputy Associate Administrator, Science mission directorate, Dr. Ghassem Asrar. "Also a key factor in the selection process was the initiative shown in putting together partnerships with public, private and academic organizations," he added.

Peer panels and NASA program managers reviewed 172 proposals for their merit, cost, and relevance to NASA goals and objectives. The projects include participants from 22 states and more than 59 organizations.

For a listing of the projects on the Internet, visit <http://science.hq.nasa.gov/earth-sun/applications/index.html>. For information about NASA's Science mission directorate, visit <http://www.science.nasa.gov>.



# War on Error

## Effects of physiological factors can be reduced

By Sarah Merlin

X-Press Assistant Editor

Sleep. It's not just for meetings anymore.

That was the light-hearted take on a life-threatening issue that two career aviation safety officials brought to Dryden in April in their "Global War on Error" presentation.

Fatigue, and other physiological factors, are key contributors to human error, and can be addressed simply by being aware of their very human root causes, Thomas Curran and Tony Kern told employees in respective talks. Couched in aviation terms but with applications for everyday life, the GWOE presentations highlighted the reality that "being an Iron Man is not enough," Curran said. "Even the best intentions, the best effort, the best training are not enough.

"Fatigue can kill you."

Curran is a Federal Aviation Administration Aviation Safety Inspector for Operations. During his career as an airline pilot, in which he logged over 16,700 hours of flight experience in multi-engine aircraft, he was a crewmember on a commercial transport that crashed on approach to Guantanamo Bay, Cuba, in 1993. Fatigue was cited as a primary contributor to the crash.

Kern, a retired Air Force pilot who flew B-1B bombers, was involved in a mid-air collision over Saudi Arabia in a KC-135. He is an author of five books on pilot performance and senior partner in Convergent Knowledge Solutions, a Florida-based firm specializing in improved human performance in high-risk endeavors.

Curran and Kern recalled their personal experiences in



EC05 0088-07

NASA Photo by Tom Tschida

*Thomas Curran, left, and Tony Kern had a simple message for Dryden employees – fatigue can kill you. In separate presentations, they stressed that the conditions leading to errors can be addressed.*

illustrating the role of human factors in accident prevention.

Fatigue, Curran said, causes professionals to take dangerous shortcuts in established procedures and makes it difficult to grasp abstract concepts and their consequences. In an examination by the National Transportation Safety Board of 37 accident cases, he said, fatigue was identified as a contributing factor in a third of the incidents.

Curran recommended steps beyond the basics of appropriate levels of rest to prevent fatigue-induced tragedies. Citing NASA's experience with the loss of Space Shuttle Columbia, he said a willingness to speak up and make dissenting viewpoints known was critical to mission safety.

"You have an obligation to challenge, and then to respond" to situations that appear dangerous or unsound, he said. "Even if it's legal" – as was the case with crew-rest conditions

in the 1993 transport accident, which met FAA regulations – "it doesn't mean it's okay."

Beyond fatigue, Kern elaborated on other physiological stress factors that contribute to the underpinnings of error, most of them inherent in human nature.

Rather than viewing human error as an adversary, Kern said, a "military science approach" should be taken to recognizing and then preventing conditions that cause mistakes to happen.

"It's better to develop people's capabilities as an offense against error," he said, calling "the crooked timber of human infallibility" a tool in accident prevention.

Working with the kind of high achievers that typically become NASA pilots and engineers, for instance, Kern said it was important to recognize that "the character traits of high achievers are desirable," and

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## Dryden in brief



ED05 0117-09

NASA Photo by Tom Tschida

## Congressman learns more about Dryden

U.S. Rep. Ken Calvert, R-Calif., chairman of the House Subcommittee on Space and Aeronautics, was briefed by X-43A Chief Engineer Laurie Grindle during a recent tour of Dryden. Calvert, accompanied by several staff members, was briefed by Center Director Kevin Petersen and members of his staff on Dryden's role as a flight research institution, and then reviewed some of the Center's recent, current and upcoming flight research projects. Calvert's tour was the second in a series of visits to all 10 NASA field centers designed to better acquaint him with the roles and responsibilities of each. A subcommittee of the House Science Committee, Calvert's committee has oversight of NASA and other federal agencies dealing with aeronautics and space issues. He represents California's 44th Congressional District, which covers portions of Riverside and Orange counties.



EC05 0062-1

NASA Photo by Tom Tschida

## Collins gives Bedke glance at Space Shuttle landings

Brig. Gen. Curtis Bedke, commander of the Air Force Flight Test Center at Edwards Air Force Base, received some first-hand insight in May on how to fly a Space Shuttle approach and landing, courtesy of NASA astronaut and STS-114 mission commander Eileen Collins. Bedke was aboard one of NASA's modified Grumman Gulfstream-II Shuttle Training Aircraft as Collins flew a series of simulated Space Shuttle approaches to Edwards' main runway in preparation for the upcoming Shuttle mission. Although Kennedy Space Center is the primary landing site for Space Shuttle missions, flight crews practice the Shuttle's steep approach and landing at Edwards in case weather or other situations preclude a landing at the Florida site and force a diversion to Edwards and Dryden.

## In memoriam

### Former crew chief dies

Robert G. Boyd, a former Dryden crew chief, has died. In a career spanning three decades, Boyd worked with the F-100, F5D and the Boeing 747 modifications for the Space Shuttle Carrier. "He was a good man and a good friend," said this 1970s image of Boyd. Do-Bill Dana, retired Dryden pilot and chief engineer. accepted by the Desert Tortoise Preserve in California City.



## Recognition ... from page 2

was recognized as "a government-industry-university research team, for bringing SVS and enhanced-vision avionics to an impressive level of functionality, significantly improving aircraft safety during reduced visibility flight conditions."

"We're elated to see the hard work and extraordinary achievement of our NASA aeronautics teams and individuals honored in this way," said Dr. J. Victor Lebacqz, NASA associate administrator for aeronautics research. "The X-43A team's accomplishments speak to exciting breakthroughs in aviation in the future, and the Synthetic Vision project touches the public right now with increased flight safety."

The Laureates Hall of Fame Award in the space category went to a collaborative team that includes the Jet Propulsion Laboratory, Pasadena, Calif.; Cornell University, Cornell, N.Y.; the aerospace industry; and the Mars Exploration Rover mission team "for its remarkable year investigating the Martian surface with Spirit and Opportunity."

Also recognized in the space category was the International Space Station's Expedition 9 crew, astronaut Mike Fincke and cosmonaut Gennady Padalka, as well as the U.S. and Russian ground teams. They were cited for completing several never-before-accomplished

tasks during their six-month mission on the ISS in 2004.

Dr. Charles Elachi, JPL director, was recognized for his leadership of the Mars Exploration Rover program and the Cassini mission team, missions dedicated to searching for signs of life on Mars and unveiling the mysteries of Saturn's moon Titan.

The JPL and Lockheed Martin Stardust team was honored for designing and guiding the Stardust spacecraft to within 140 miles of the nucleus of the comet Wild 2. Stardust, scheduled to return to Earth early in 2006, has harvested the first comet dust.

The magazine also recognized the accomplishments of Cassini spacecraft engineers and scientists. Following Cassini's long journey to Saturn, the mission team carried out the highly successful June 30 orbit insertion and gathered close-up data.

Several historic NASA figures also were honored with 2004 Laurel Legend awards. Legend awards are given to previous Laurel winners or individuals chosen for contributions to the global field of aerospace over a period of years. This year's honorees included the late Maxim Faget, famed NASA spacecraft engineer. Also recognized were America's first women astronauts: Sally Ride, Kathy Sullivan, Rhea Seddon, Anna Fisher, Shannon Lucid and the late Judith Resnick.

# Bryant leaves behind a legacy

**Compiled by Peter Merlin**

Dryden History Office

Noted NASA engineer Roy Glenn Bryant died May 30 at his Lancaster home. He had retired from Dryden in April after a 48-year career, much of it dedicated to work with the Center's legendary research aircraft.

Bryant was born Feb. 3, 1933, in Olton, Texas. He received a Bachelor of Science in mechanical engineering from Texas Technological College in Lubbock in 1956 and then joined the U.S. Army with a rank of lieutenant.

After completing the Student Officer course at Ft. Belvoir, Va., Bryant was assigned as platoon leader in the 547th Engineer Combat Battalion at Ft. Ord, Calif., where he served as an engineering instructor.

On May 3, 1957, Bryant accepted an active-duty assignment as an aeronautical research engineer with the National Advisory Committee for Aeronautics, NASA's predecessor organization, joining the Project Coordinator's Group at the NACA High Speed Flight Station at Edwards, Calif. There he was responsible for coordinating flight research activities of the HSFS engineering, operations and instrumentation divisions. His first assignment was as project engineer for the JB-47A aircraft, which was used for aerodynamic noise studies and landing-approach investigations.

Bryant subsequently was assigned to manage projects involving several of the so-called "Century Series" fighters such as the F-100, F-104 and F-107. While some projects, such as that with the F-107A, were of short duration, he sometimes found himself associated with an airplane for longer than the span of most people's careers; Bryant managed research projects involving the F-104 from 1957 to 1994.

Bryant ended his active-duty Army career in October 1958 just two weeks after the NACA became NASA. At that time, he became a full-time NASA employee but remained in the Army Reserve. At what was then known as the Flight Research Center (at Edwards), he served as an aeronautical research engineer in the Special Projects Office, where he continued his duties as project coordinator.

In October 1959, Bryant was transferred to the stability and control branch of the Research Division. While continuing his work with various jet aircraft projects, he also served as a member of the X-15 Research Airplane Flight Test Organization until the program's completion in 1968. The X-15, the first of the hypersonic rocket planes, was considered one of the most successful aviation research programs of all time.

During the 1970s, Bryant continued to manage NASA's F-104 fleet. These supersonic jets performed chase and support duties as well as serving as testbeds for various research projects. In September 1975, he became project manager for the NB-52B. This airplane, originally modified as a launch platform for the X-15, became a workhorse at the Flight Research Center. It was used to carry or launch a wide variety of research vehicles and experiments until its retirement in December 2004.

In 1976, Bryant was assigned as project manager for the YF-17 Lightweight Fighter prototype used by NASA for base drag studies and transonic maneuvering capabilities evaluations. Although forced to work under

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E-6172

NASA Photo

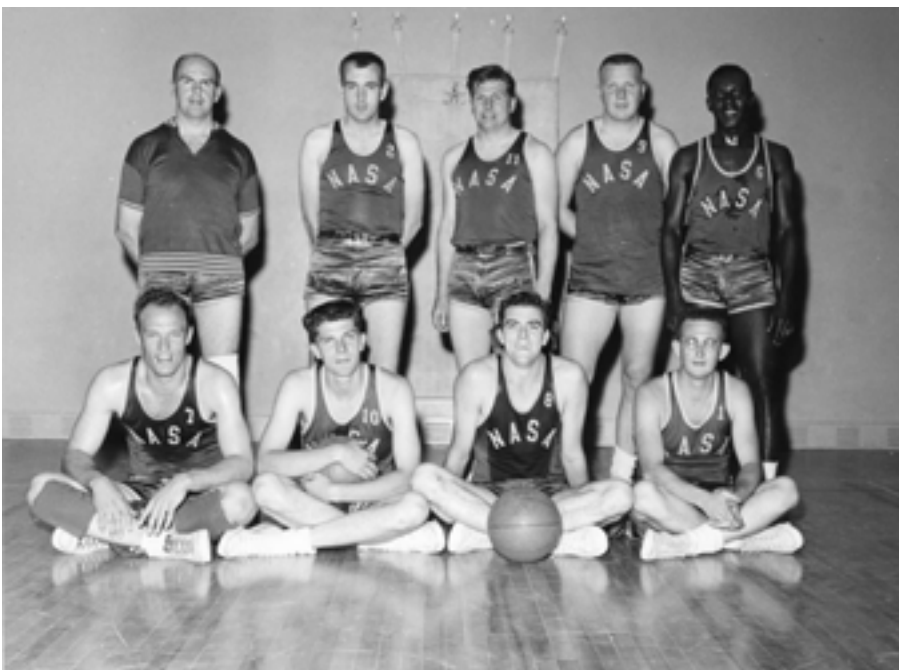
*Roy Bryant is seen at far right in this 1959 image, wearing a flowered shirt, with other Dryden engineers as they inspected film records of the X-15 from its first powered flight. Bryant had recently retired from Dryden following a 48-year career.*



EC87 275-5

NASA Photo

*Bryant makes a point to, from left, Richard Reeves, James Fletcher, Dale Compton and Ted Ayers. Below, Bryant is seated in the front row at left in this photo of the NASA basketball team from 1959 to 1960.*



E-5175B

NASA Photo

## Bryant fondly remembered

At the time of long-time NASA engineer Roy Bryant's passing, colleagues past and present reflected on the career and the achievements of one of the Center's most enduring figures.

Former Dryden Chief Pilot Gary Krier recalled the period during which he and Bryant worked together on the YF-17.

"Roy and I worked on several small projects together but we had one outstanding experience in the 70s that captured his being perfectly," Krier reflected.

"Dryden had a brief window of opportunity to fly one of the most exotic aircraft of its time, the YF-17, which was the unsuccessful candidate for the Lightweight Fighter competition. Lord knows why it was unsuccessful, because it was a top-notch performer and flyer. It was the only aircraft I ever gave a Pilots' Rating '1' during air-to-air refueling because of its hands-off stability and perfect responsiveness on command.

"The demands on Dryden were severe," he continued. "We had Northrop, the U.S. Navy, NASA researchers, McDonnell Douglas, and the Air Force all wanting edge-of-the-envelope data that the program didn't acquire in its tightly funded, time-limited competition. Additionally, Roy P. Jackson, a Northrop executive on exchange to NASA Headquarters demanded that Dryden finish the program ahead of the agreed schedule because Northrop was going to take the air-

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EC05 0108-14

NASA Photo by Tom Tschida



EC05 0049-1

NASA Photo by Tom Tschida

# Desert Spring

*This year's unusually wet winter in the Mojave Desert fueled a burst of life among flora and fauna. Dryden photographers offer this brief photo essay capturing highlights of the second rainiest winter on record. The images were captured along the shores of the (not so) dry lake beds on Edwards Air Force Base.*



EC05 0108-01

NASA Photo by Tom Tschida



EC05 0108-12

NASA Photo by Tom Tschida



EC05 0108-05

NASA Photo by Tom Tschida



EC05 0108-02

NASA Photo by Tom Tschida



EC05 0108-10

NASA Photo by Tom Tschida



EC04 0232-3

NASA Photo by Carla Thomas



# Challenge

## Walsh puts the pedal to the metal in race across U.S.

By Sarah Merlin

X-Press Assistant Editor

When it's quitting time at Dryden most of us are out the door, just enough energy left to get home and deal with dinner and homework before we have to get up and do it all over again.

Not so for Kevin Walsh, chief engineer on the High-Altitude, Long-Endurance – or HALE – UAV project. Most days, for Walsh the 4:00 bell just means it's time to suit up, mount up and bike the back half of his 70-mile-round-trip commute; he did the first half around sun-up. On either leg of the trip, it may be windy, freezing cold, or 100 degrees.

"I guess I just love riding" is his only explanation.

Guess so. Walsh loves riding so much, in fact, that on June 19 he'll be out of the gate in San Diego to tackle the Race Across America, an officially sanctioned 12-day ultra-marathon cycling event. His goal is to average about 300 miles a day in hopes of making it across the finish line in Atlantic City, N.J., by July 1. The race marks the culmination of 25 years of die-hard, take-no-prisoners bicycling that has dominated Walsh's life and leisure hours. And he knows he's ready.

Walsh says a high point in those 25 years came in 2002, when he first qualified for the RAAM, as it's known. He completed the 508-mile Furnace Creek qualifying event in a sleepless 36 hours and 20 minutes on the route from Magic Mountain in Santa Clarita through 29 Palms and into Death Valley. Peddling as fast as 65 mph during the night, he averaged about 14 mph – taking into account a total of some 35,000 feet of elevation on parts of the ride. All in a day's work for the 47-year-old father of two.

Furnace Creek was just one of many ultra-marathon events Walsh has conquered, and which together with the daily commute have rendered him ready for the RAAM. He's ridden in dozens of century and double-century events (100 and 200-mile rides), his first century race in 1980 and first double-century in 1982. He also still goes for "pleasure rides" with friends, and regularly pedals the 85 miles to Westlake Village to visit his in-laws.

To reiterate: "I really like going places on a bike."

Going places like Atlantic City will mean a test of everything Walsh has worked hard to attain in his cycling career. To get this far, he says he's taken the same detail-oriented approach to cycling that he does to engineering.

Ultra-cycling is for neither the faint of heart nor the young. Most events, Walsh says, are populated by people considered long of tooth in other types of athletic competition, in large part because years of training are required to develop the stamina needed to go the distance. Taking the broader view, there's also the issue of what oldsters used to call stick-to-it-iveness; to excel in Walsh's world means to fail, to face setbacks, to recoup, to start over – without ever considering giving up. Such experiences take time.



ED05 0118-01

NASA Photo by Tom Tschida

*HALE project chief engineer Kevin Walsh reviews information in his office, but his bike is always near. Walsh will enter the 3,000-mile Race Across America on June 19, joining 25 others who will make the trek from San Diego to Atlantic City, N.J. Stopping only two to three hours each night to sleep, Walsh hopes to average 300 miles per day and cross the finish line July 1. Daily reports on his progress will be available on Dryden's Web site at [http://www.nasa.gov/centers/dryden/home/walsh\\_updates.html](http://www.nasa.gov/centers/dryden/home/walsh_updates.html)*



ED05 0118-10

NASA Photo by Tom Tschida

*Endurance cyclist Kevin Walsh pedals past a retired SR-71 Blackbird used formerly by Dryden researchers for high-speed test. Walsh regularly makes the 70-mile-round-trip commute to work on his bike as part of a rigorous training regimen. An avid cyclist for the past 25 years, the Race Across America will take him through 13 states and across mountain summits as high as 10,000 feet.*

The challenges start with the demands on the body. As a member of a select group known as "elite" athletes, Walsh's physical condition approaches the mystical. Six feet two inches tall and 175 pounds, his blood pressure is 110/65 and his cholesterol is 120. His resting heart rate, 34 beats per minute, would suggest looming tragedy in normal adults but is all that his ultra-efficient ticker requires to send blood coursing through his veins and limbs.

During the race, he'll consume 12 to 14,000 calories daily, riding for about 21 or 22 hours and sleeping for two to three. Unlike such similar events as the Tour de France, the RAAM has no built-in rest periods. His "meals" will consist of an eight-ounce flask containing a carbo, fat and protein-laden paste every one to two hours. There'll be an ice cream treat before bedtime, the occasional fruit protein shake for a change of pace and of course plenty of fluids.

As for stick-to-it-iveness, Walsh has exhibited his share. The small stuff involves people throwing beer bottles at him and being chased by dogs. Larger roadblocks included back surgery five years ago followed by acupuncture and physical therapy and having to use a walker as, week by painstaking week, he slowly worked his way back into the saddle.

The day friends helped him off his walker and onto his bike for "two sl-o-o-w-w blocks," he recalls, was another high point.

"It was the greatest feeling, just getting air in my face again," he says.

Walsh credits his upbringing for much of what drives him, and is quick to credit the family and friends who keep him going. His wife, Kristy, and their boys ages 18 and 20 have no memory of a life that didn't include Walsh riding his bike. His dad was an Irish-Catholic Marine "and a perfectionist."

The oldest of four children, Walsh gave early indications of possessing his father's drive; for six years, he arose every morning at 4:30 a.m. to deliver newspapers in the family's Chicago Heights neighborhood.

"If it's 10 degrees below or colder, don't wake me up," were his instructions to his mom. Barring those conditions, though, he was on his bike and out the door seven days a week to toss the Chicago Tribune and Sun-Times.

Among other things, that kind of perseverance has taught Walsh the value of having a plan and sticking to it. Being an ultra-marathoner and competing in an event like the RAAM, he says – like being a research engineer – hinges on your ability to create a plan, refine it and then never waiver from it without a really good reason. Details count.

"You have to have a plan," he stresses. "And the prep is everything."

For him, the latter has meant years in training, years of refining his equipment arsenal and his routine. It also means having tools, supplies and

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# Young named outstanding leader

By Roberta Ross

Public Affairs Specialist

Gwen's Young's life has been anything but ordinary since she joined NASA as a Presidential Management Intern at NASA Headquarters in Washington, D.C., 22 years ago.

Young, a native Pacific Islander, was fresh out of college with a master's degree in public administration when she began work in the Agency's comptroller's office in 1983.

Now Dryden's associate director for management, Young's professional experience and growth through a series of increasingly responsible positions has helped her serve as a role model for young women, demonstrating to them that they can be anything they choose to be regardless of ethnicity or background.

The Federal Asian Pacific American Council honored Young in June 2004

with its Outstanding Individual Leadership Award for achieving personal goals and displaying exceptional leadership qualities that will inspire others to follow.

Born in Hawaii as Gwendolyn Vaisega Young – her middle name reflecting her maternal grandmother's first name – she was raised primarily in Southern California. Her maternal grandparents are Samoan; her paternal grandmother is Hawaiian and grandfather is Korean.

As part of a military family that moved frequently, she took comfort in her studies, and unlike many girls, she thoroughly enjoyed math and science.



Gwen Young

In high school, she took delight in challenging the boys to see who could get the highest grades.

"Though I did very well in high school, I had few role models to emulate," she recalls.

She obtained a Bachelor of Science degree in elementary education and her master's from Brigham Young University in Provo, Utah. Her selection as a Presidential Management Intern and

her appointment to serve at NASA Headquarters catapulted her career prospects from the ordinary to the extraordinary.

One of her major assignments at NASA Headquarters was supporting the Agency's comptroller, Thomas Newman, during the budget formula-

tion process. She also worked briefly on Capitol Hill for then-congressman Daniel K. Akaka of Hawaii, supporting his appropriation subcommittee's staff work.

"Through these experiences, I learned about the federal budget process and decided to work in this area for the rest of my career," she said.

Before coming to Dryden, Young served as Resources Management Officer, responsible for all budget activities at Stennis Space Center in Mississippi. She also worked in the Office of the International Space Station at both NASA Headquarters and in the Space Station Program Office in Reston, Va. During this time, she completed a one-year detail as the NASA budget liaison in the Air Force/NASA's Joint Program Office of the National Launch System

**See Award, page 10**

# Bui selected for NAFP fellowship

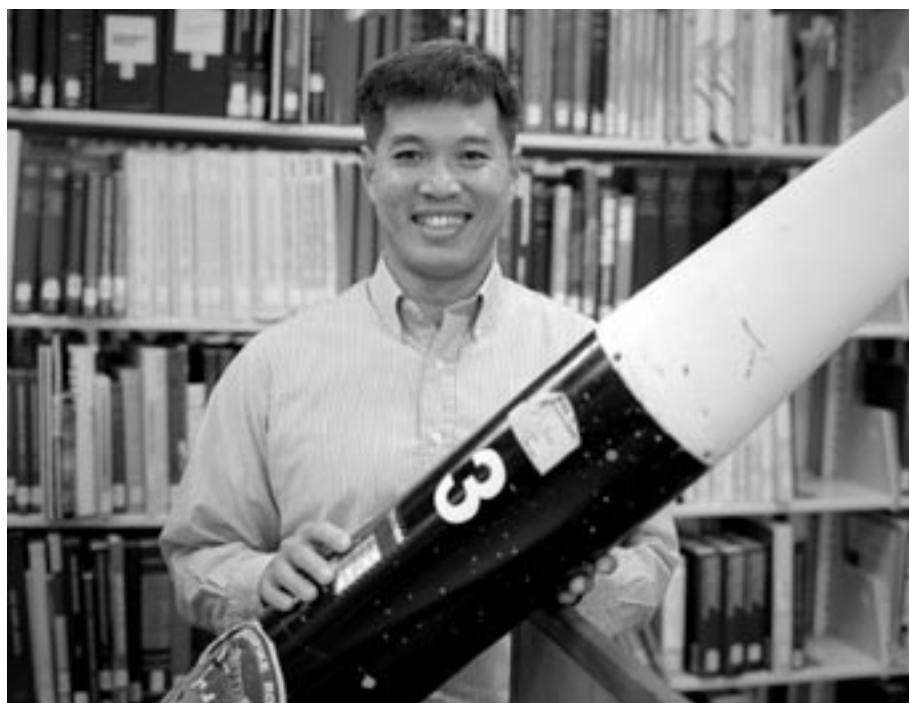
By Roberta Ross

Public Affairs Specialist

Dryden aerospace engineer Trong Bui will have the opportunity to share some of the most current NASA engineering technology at two regional universities following his selection as a 2005 NASA Administrator's Fellowship Program Fellow.

Bui, an engineer in the propulsion and performance branch of Dryden's Research Engineering directorate, elected to teach in the aerospace engineering department at California Polytechnic State University, Pomona, for a full academic year. He also will be an instructor with California State University, Fresno's mechanical engineering department satellite office at the Lancaster University Center in the Antelope Valley.

The NAFP is designed to enhance faculty teaching in science, technology, engineering and mathematics at historically black colleges and univer-



EC04 0359-3

NASA Photo by Tom Tschida

Trong Bui, Dryden's principal investigator for aerospike rocket tests, shows one of the rockets used in the first series of flights, conducted last summer in Texas.

sities, Hispanic-serving institutions, tribal colleges and universities and other minority-serving institutions. The program also seeks to increase the ability of these post-secondary schools to respond to NASA's overall research and development mission.

Secondarily, the program seeks to enhance professional development of NASA employees.

Those employees selected by NASA's Office of Education to be NAFP fellows spend approximately nine months teaching, conducting research in science/engineering or assisting in an administrative capacity at these institutions. For the remaining nine to 13 months of the two-year fellowship, the fellows are assigned to professional development posts at NASA and other organizations.

Bui's professional development assignment will be working with

**See Fellowship, page 10**

# Losey named top NASA videographer

A Dryden videographer has won NASA's highest award for videography for 2004.

Lori Losey, an employee of Arcata Associates at Dryden, was honored with NASA's Videographer of the Year award for her work in two of the three categories in the NASA video competition, public affairs and documentation.

In the public affairs category, Losey received a first-place citation for her footage of an Earth Science mission flown aboard NASA's DC-8 Flying Laboratory in South America last year. Her footage not only depicted the work of the scientists aboard the aircraft and on the ground, but she also obtained spectacular footage of flora and fauna in the mission's target area that helped communicate the project's environmental research goals.

Losey also took first place in the documentation category for her acquisition of technical videography of the X-45A Unmanned Combat Air Vehicle flight tests. The video, shot with a hand-held camera from the rear seat of a NASA F/A-18 mission



EC04 0081-1

NASA Photo by Jim Ross

Dryden's Lori Losey was named NASA's 2004 Videographer of the Year in part for her camera work during the AirSAR 2004 science mission in Chile.

support aircraft, demonstrated her capabilities in recording precise technical visual data in a very challenging airborne environment.

The award was presented to Losey during a NASA reception at the National Association of Broadcasters convention in Las Vegas April 19.

A three-judge panel evaluated entries for public affairs, documentation and production videography on professional excellence, technical quality, originality, creativity within restrictions of the project and applicability to NASA and its mission. Entries consisted of a continuous video sequence or three views of the same subject for a maximum of three minutes' duration.

"Lori is a talented videographer who has demonstrated extraordinary abilities with the many opportunities she has received in her career at NASA," noted Linda Peters, Arcata Associates' Video Systems Supervisor at Dryden.

Losey's award was the second major NASA video award won by members of the Dryden video team in two years. Last year, Steve Parcel took first place in the documentation category for his camera and editing work in documenting a June 2003 checkout flight of the Helios Prototype solar-electric aircraft equipped with a supplementary experimental fuel-cell power system.





EC05 0043-01

Above, Dryden’s Tony Frackowiak prepares the two AV-3 aircraft for flight. The pair was part of a joint flight experiment by Ames Research Center and Dryden.



EC05 0043-06

Frackowiak, holding the vehicle, gets a hand with the APV-3, above. At right, Dryden operations co-op student Shannon Kolensky holds steady one of the APV-3 UAVs, flown in the Networked UAV Teaming Experiment, during the aircraft’s engine runup.

# APV-3 Dryden software

By Beth Hagenauer and Jonas Dino  
Dryden Public Affairs and Ames Research Center Public Affairs

The old saying “birds of a feather flock together” can now be applied to a couple of small Uninhabited Aerial Vehicles flown in a NASA research experiment using principles derived from studies of fish and bird motions to simultaneously guide them past obstacles.

Engineers and technicians from NASA Ames Research Center, Moffett Field, Calif., and Dryden recently conducted flight tests over a ‘virtual’ forest fire to evaluate new flight-control software that will give UAVs the ability to autonomously react to obstacles during pre-programmed missions. The tests were conducted over a remote area of Edwards Air Force Base to investigate cooperative flight strategies for airborne monitoring and surveillance of natural disasters and for atmospheric sampling.

“We developed and flight tested several novel approaches for providing assistance to wildfire suppression crews using a team of two small UAVs,” said Ames’ John Melton, principal investigator for the Networked UAV Teaming Experiment. “The aircraft were flown using a combination of rules from nature and robotics to cooperatively transit and search a virtual forest fire.”

NASA researchers borrowed a mathematical tool devised by Hollywood moviemakers to map and mimic the choreography of swarms of birds and fish as they wheel and turn without striking one another. These in turn guided the inexpensive robotic UAVs around obstacles such as simulated smoke plumes.

Called the boid algorithm, this tool separates the activities of individual birds or fish into three categories: heading matching, where the animals all try to keep the same direction; flocking, where the animals move to come into proximity with one another; and collision avoidance, in which the birds or fish maneuver to keep from colliding.

Former Dryden research algorithm developer Jason Clark said the boid algorithm has been adapted to direct remotely operated UAVs to fly within predetermined proximity to one other while avoiding collisions and maneuvering around phantom objects placed digitally in their flight paths. Though still in its infancy, this emerging software technology promises to one day enable swarms of UAVs to conduct aerial searches and participate collectively in activities such as firefighting.

For the tests, NASA used Piccolo autopilot system and global positioning system transmitters to enable a pair of RnR Products APV-3 UAVs to maneuver responsively in relation to each other. With the two 12-foot wingspan UAVs, the NASA researchers proved the concepts inherent in the boid algorithm. Neither aircraft communicated with the other directly, but sent and received signals through a central computer station on the ground that directed both airplanes to maneuver as needed.

In one test, the software automatically developed individual flight plans and transmitted them to each aircraft. After passing their first few waypoints, one of the UAVs was commanded to begin orbiting over the virtual fire. The remaining search points were then transmitted to the second aircraft, which incorporated these points into its flight plan and the mission was completed.

“This technology may one day enable swarms of aircraft to move safely from one area to another as a flock or group,” said Melton. “A number of UAVs could be flown ‘stacked’ in a vertical column with instruments to collect air samples on future science missions or help ground personnel monitor forest fires and other natural disasters.”

NASA’s Aeronautics Research mission directorate is supporting a variety of technology development projects for remotely or autonomously controlled high-altitude, long-endurance UAV aircraft. Such UAVs have the potential to serve as platforms for a wide variety of Earth science, surveillance, communications relay and disaster-mitigation missions, especially in circumstances where flying a manned aircraft is dangerous.

The Networked UAV Teaming Experiment was sponsored by the directorate’s Aeronautics Systems Analysis project.



EC05 0043-08



# en, Ames team up to see how new flight control ware works in UAVs during a virtual firefighting effort



-46



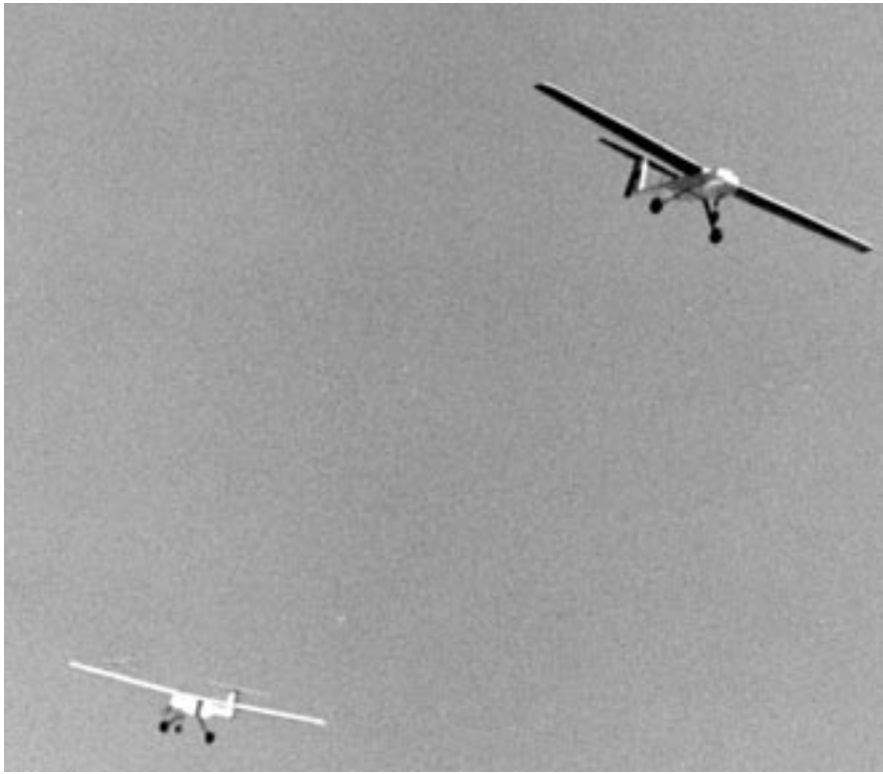
-21

archers watch as one of two small AV-3 aircraft flares for  
on a remote Edwards Air Force Base roadway. The mis-  
gated cooperative flight strategies for airborne monitor-  
veillance of natural disasters and for atmospheric sam-  
e, the team records data in a makeshift mission control.



EC05 0043-44

*This spring, two identical APV-3 aircraft validated cooperative flight control software in the Networked UAV Teaming Experiment at Dryden. Engineers and technicians from Ames and Dryden conducted tests over a virtual forest fire to evaluate new software that will allow UAVs the ability to autonomously react to obstacles as they fly pre-programmed missions.*



EC05 0043-40



EC05 0043-47

# Dryden employees work to inspire students

By Alan Brown  
Dryden News Chief

Daydreams of flight gained a sharper focus recently as Edwards Air Force Base Middle School students learned of potential aerospace careers during the school's recent Career Day.

Several Dryden employees were among presenters who explained their jobs to students, encouraging them to consider aerospace careers while working hard in school.

Students paid rapt attention as rocket scientist Trong Bui described his research work on several projects, including his investigation of aerospike rocket engine nozzles.

Engineer Jessica Lux-Baumann detailed her job of setting up Dryden mission control rooms for research flights such as the two successful X-43A scramjet flights in 2004.

The visual arts were in focus as Dryden's lead photographer, Jim Ross, spoke of the possibilities in his specialty, aerial photography. While a volunteer donned a flight suit and helmet, Ross explained difficulties encountered in trying to hold a camera up to the eye to photograph NASA's advanced aircraft during research missions while wearing such gear in the back seat of a high-performance jet.

There was no shortage of eager response during question-and-answer periods that followed each presentation.

Career days are designed to encourage students to consider and work toward the many future possibilities in the work-a-day world. Edwards Middle School is a NASA Explorer School and was recently named a California Distinguished School.



EC05 0089-02 NASA Photo by Tom Tschida

Dryden aerospace engineer Trong Bui demonstrates aeronautics concepts to students attending a career day at Edwards Air Force Base Middlle School.

## Award... from page 7

program at Los Angeles Air Force Base, Calif.

Young transferred to Dryden in 1995 when she was appointed the center's Chief Financial Officer, responsible for overall financial and budget activities.

As associate director for management since June 2002, Young has been responsible for Dryden business functions such as acquisition

and finance to ensure that these provide efficient and effective support of Center programs. Currently, Young and Dryden Deputy Director Steve Schmidt are tasked with restructuring the institution to be more competitive in seeking new business opportunities both from within and outside NASA. Their challenge is to make the type of cuts that do not negatively affect the Center or its

key responsibilities in such areas as safety, security and other fiduciary responsibilities while reducing overhead costs.

Young, who celebrates her 22<sup>nd</sup> year with NASA in June, says that she has thoroughly enjoyed her time with NASA and looks forward to an exciting future ahead.

"I'm never bored," she quipped, "just very tired."

In her spare time, Young is active on the board of her condominium association, in her church and likes to cook.

Young enjoys mentoring young women, encouraging them to believe in themselves and to know they can accomplish anything they choose. She participates in the Women of NASA program in hopes of being a role model to girls from minority backgrounds and to girls who enjoy math.

## Challenge ... from page 6

friends (six of them, taking 12-hour shifts) following in an RV during the race, each with a clearly defined role in Walsh's RAAM experience. Dryden meteorologist Ed Teats will be monitoring the weather for the entire trip, relaying information to the RV crew.

Crewing for a friend in the 2004 RAAM was another part of Walsh's prep work, and it taught him some valuable lessons about adhering to "the plan."

A month before the race, one rider got a new bike, and the effects were disastrous. The seat change impacted the rider's right knee, setting off a domino injury effect throughout his body and causing him to drop out. It's not a mistake Walsh will ever make.

Those lessons, and everything else that went into two decades of preparation, will serve him well in meeting what by any measure will be daunting challenges posed by the RAAM.

Since the first RAAM, in 1982, only about half of the 121 people who've

qualified have officially finished. Just 26 people will participate in this year's event as solo riders; solo and team entrants ride the same course. Riders will cross 13 states, climbing and descending 109,880 feet before reaching the finish. The route is shared with normal traffic on secondary roads with an occasional venture onto a freeway.

"The only fear is other cars on the road," Walsh admits.

And though the race route will take Walsh across three summits in Colorado over 10,000 feet, the steepest hills will be the "rollers" in West Virginia near race's end. He hopes to get 350 miles behind him the first day, but knows he will cover progressively smaller distances each day.

"I'll make real-time decisions," he says, "depending on how I feel."

But that's okay, because that's the plan. And anybody who knows Walsh also knows that "the plan" is focused on making it across the finish line.



ED05 0118-12 NASA Photo by Tom Tschida

He may not be faster than an X-1E rocket plane, but NASA aerospace engineer Kevin Walsh will be going at a good clip as he attempts to cover an average of 300 miles a day in the 12-day Race Across America.

## Fellowship ... from page 7

Lockheed Martin Aeronautics Co.'s Advanced Development Programs in Palmdale.

"I think this will be a terrific experience, and I will look forward to making the most of this opportunity at Cal Poly Pomona, Fresno State, and Lockheed-Martin in the next two years," said Bui, who joined NASA in 1990 and has worked at Dryden since 1997.

NASA employee fellows share information about NASA-specific technology with colleges and universities, while

gaining valuable insight to help guide future NASA initiative and enhancing their own technical, research and management skills to assist NASA in meeting its science and technology goals. The fellows also assist host institutions in familiarizing themselves with NASA's mission, in the exchange of NASA-specific technology, procedures for initiating and responding to NASA contracts/proposals and generally providing the institutions with background information pertinent to

establishing a relationship with the Agency.

Bui will be Dryden's second NAFP recipient. Dryden electrical engineer Kurt Kloesel previously received a NAFP fellowship in 2000 and taught in the Department of Electrical Engineering/Center for Applied Radiation Research at Prairie View A&M, Prairie View, Texas.

Bui earned bachelor's and master's degrees in aeronautical engineering from California Polytechnic State

University at San Luis Obispo and a doctorate in aeronautics and astronautics at Stanford University, Palo Alto, Calif.

Bui recently was honored by his peers at Dryden with a "One NASA Center Best" award for his collaboration with industry, the military and other NASA centers on the Dryden aerospike rocket test he directed in 2004.

More information on the NAFP may be found at <http://www.uncfsp.org/nasa/nafp/>.





NASA Photo

Dryden's Mary Ann Harness talks to attendees at the Salute to Youth event held recently in Palmdale.

## Dryden employees support Palmdale's salute to youth

Dryden employees participated May 6 in "Salute to Youth: the Career Connection" in Palmdale.

More than 1,700 area high school juniors and seniors took the opportunity to meet local employers and discuss career and service opportunities available in the Antelope Valley. The event was hosted by Los Angeles World Airports at the former Rockwell International/SR Technics facility adjacent to the Air Force Production Flight Test Installation (Plant 42). Dryden's displays and exhibits were focused on the aerospace career pathway, one of nine career tracks featured for students to explore at the event.

A NASA F-18 mission support aircraft flown by Dryden chief research pilot and former astronaut Gordon Fullerton with Dryden engineer Mike Thomson was among aircraft on display for the day.

A Dryden exhibit staffed by Mary Ann Harness of Code T focused on the Space Shuttle return-to-flight effort, while Dryden-sponsored robotics teams from Lancaster and Tehachapi high schools demonstrated robots they entered in recent FIRST – For Inspiration and Recognition of Science and Technology – robotics competition, an annual, international event sponsored by industry-academia science consortia.

Linda Tomczuk, Katrina Emery and Sondra Geddes of Dryden's Office of Academic Investments offered information about NASA careers, the Summer High School Apprenticeship Research Program and other academic programs and also displayed a space suit mock-up.

The event was sponsored by a group of Antelope Valley business, government and academic interests.

## Solvent cleanup planned

By Alan Brown

Dryden News Chief

A proposed plan to clean up potentially hazardous chemical contamination at three groundwater sites at Dryden is available for public inspection at area libraries.

During a recent meeting, Air Force and NASA environmental officials detailed plans to clean up a plume of trichloroethene, or TCE, located in groundwater beneath Dryden's aircraft ramp areas along the western shore of Rogers Dry Lake. The proposed cleanup plan was prepared by the Edwards Air Force Base Environmental Management Office in cooperation with Dryden, the U.S. and California Environmental Protection Agencies and the Lahontan Regional Water Quality Control Board.

It's believed that the plume was created when TCE, a solvent formerly used in aircraft and ground-equipment cleaning operations, was released to the soil and migrated to the groundwater beneath. Environmental officials believe the relatively low concentrations of TCE, a probable carcinogen, represent no hazard to Dryden employees or visitors due to the chemical plume being in groundwater that is beneath asphalt pavement and concrete ramp areas; the groundwater is not a current source of drinking water. However, the levels of contamination are above that allowed by federal and state environmental regulations for groundwater that could be a future drinking water source.

The area addressed in the cleanup plan originally included 19 locations at Dryden where historical records and archival research had shown

that hazardous chemicals had been used or stored. Subsequent investigation determined that eight of those locations – three involving groundwater and five soil – had high enough levels of contamination to warrant further investigation.

The proposed plan as approved by the federal and state EPAs describes the sites, human health risk assessment and the five cleanup options considered by the Air Force and NASA for the three groundwater sites, and outlines the justification for taking no further action at the five soil sites.

The proposed plan can be accessed online at <http://www.edwards.af.mil/penvmng/Documents/reviewdocs.htm>.

Printed copies also are available for review at:

- Kern County Public Library, Wanda Kirk Branch, 3611 Rosamond Blvd., Rosamond;
- Los Angeles County Public Library, 601 W. Lancaster Blvd., Lancaster;
- Col. Vernon P. Saxon Jr. Aerospace Museum, 26962 20 Mule Team Rd., Boron;
- Air Force Flight Test Center Library, 5 W. Yeager Blvd., Bldg. 2665, Edwards Air Force Base;
- Edwards Environmental Management Office, 5 E. Popson Ave., Building 2650A, Edwards Air Force Base, by appointment only at this location.

Persons desiring additional information may contact Gary Hatch, 95th Air Base Wing Environmental Public Affairs at (661) 277-1454, Gary.Hatch@edwards.af.mil.

### Dryden in brief



EC05 0086-02

NASA Photo by Tom Tschida

## Help available

Dan Fuselier, a new member of the Employee Assistance Program team, looks through exhibits on reasonable accommodation at a workshop conducted recently for Dryden employees by the Office of Diversity and Equal Opportunity. The office has established procedures to allow qualifying individuals with a disability to request reasonable accommodation to enable them to perform the essential duties of their job. For information regarding reasonable accommodation, call ext. 7447 or visit room 1023 in Building 4800.



EC05 0076-04

NASA Photo by Tom Tschida

## Women's history

Martha Ackmann, senior lecturer in Women's Studies at Mount Holyoke College in Massachusetts, speaks to Dryden and Edwards Air Force Base employees at the National Women's History Month Observance. The celebration also featured a 5K Fun Run, a panel discussion on career issues with senior-level female panel members answering questions from junior-level employees and an essay contest for local high school students. The theme for this year's National Women's History Month was "Women Change America."

## Aloha, friends



EC05 0110-011

NASA Photo by Tom Tschida

Gwen Young, at right, Dryden associate director for management, volunteers to participate in a dance lesson provided by The Hula Girls at the Asian American Pacific Islander Heritage Festival 2005. The theme for this year's event was "Liberty and Freedom for All." Other activities held during the month included a bowl-a-thon, food sampling event and martial arts exhibition. Dryden and the Air Force Flight Test Center co-hosted the events.

## Mission ... from page 1

successes but some objectives will require a second set of sorties, scheduled for later this summer.

“UAVs of Altair’s class hold great promise for the advancement of Earth science,” Jennison said. “There are still many technical challenges to be discovered and conquered in their application and in their merging into the airspace with other users, but we’re making progress.”

As part of those missions, Dryden’s science instrument, called the Research Environment for Vehicle Embedded Analysis on Linux, or REVEAL performed well, said Dryden’s Larry Freudinger, REVEAL development team lead.

The REVEAL system is a programmable data acquisition and processing tool designed to help researchers develop network-oriented solutions for interacting with science instruments on remote aircraft. REVEAL gathers and stores information about the aircraft and other instruments, performs additional calculations and relays time-critical status data via satellite between the aircraft and ground-based researchers. Leveraging network technologies for integrating aircraft instrumentation lowers costs and while interactive network connectivity provides instrument operators with the flexibility needed to adapt to changing situations.

“We’re very pleased with REVEAL’s inaugural performance on Altair and its ability to adapt to the challenges of UAV-based science missions,” Freudinger said. “Our prototype airborne sensor Web capability delivered an immediate return on investment by providing near-real-time status information to all Altair project participants with Internet access.”

NASA’s digital camera system and electro-optical infrared sensor also proved their mettle during the mission. The digital camera system was used in shoreline mapping, and characterization of the shore and inland features for habitat mapping and ecosystem monitoring. About 260 images documenting nearly 25 percent of the Channel Islands were obtained during the mission series.

The electro-optical infrared sensor demonstrated capabilities for day and night surveillance and marine mammal surveys. Real-time surveillance capabilities were demonstrated in areas north of Santa Cruz and Santa Rosa.

Images of a sea lion rookery containing more than 100 members were clear enough to be used in population studies. The instruments successfully identified a U.S. Coast Guard helicopter and several surface vessels. Studies using the imagery proved the technology could be used by enforcement officials in tracking and identifying vessels at distances of up to 15 nautical miles. Video captured by the cameras also illustrated the potential for using real-time images in surveillance and ecosystem monitoring.

The mission series also served to solidify the partnership between Dryden and NOAA, said Frank Cutler, Dryden Earth Science Capabilities Demonstration project manager.

“(NOAA staff) are learning what it takes to operate a UAV within the national airspace system,” he said. “NOAA representatives learned the value of Dryden’s expertise in operating UAVs and that we can help them execute their missions. It looks like this is the beginning of a successful relationship.”



EC05 0090-19

NASA Photo by Tom Tschida



EC05 0090-16 NASA Photo by Tom Tschida

*Above, the Altair aircraft is outfitted for a series of missions conducted for the National Oceanic and Atmospheric Administration. Dryden assisted NOAA with that agency’s first efforts at completing a science mission with an uninhabited air vehicle. At left is an instrument developed at Dryden by Larry Freudinger, program lead for the Research Environment for Vehicle Embedded Analysis on Linux Development program.*

Scott C. Rayder, NOAA chief of staff, wrote in a letter to Center Director Kevin Petersen:

“I wanted to contact you to thank you and your staff from NASA Science and Aeronautics directorates for your contributions to the recent Altair missions. NOAA would like to voice our support for continuation and growth of the NOAA/NASA partnership to develop UAV technology supporting network centric global observation systems.

“While I understand more work needs to be done to mature UAV systems for these critical applications, NOAA looks forward to continuation of the partnership with NASA to resolve the challenges and realize the true operational capabilities UAVs can provide. Both agencies are breaking new ground here and it is NOAA’s intention to leverage the experience and capabilities of NASA’s Science and Aeronautics Directorates staff to make it happen.”

The Altair mission marked the first time NOAA has funded a UAV Earth science demonstration mission. The

experiment is aimed at introducing a new era of science by using a UAV in an operational environment to fill research gaps in critical areas such as weather and water, climate and ecosystem monitoring.

The Altair, whose development was funded in part by NASA through the Environmental Research Aircraft and Sensor Technology, or ERAST, program carried a payload of instruments. Mission objectives included evaluation of UAVs for future NOAA scientific and operational requirements for oceanic and atmospheric research, climate research, marine sanctuary mapping, law enforcement, nautical charting and fisheries assessment.

“NASA is glad to see that UAVs are being used for more and more diverse and important operations,” said Terrence Hertz, deputy associate administrator for technology, NASA Aeronautics Research mission directorate. “We’re looking forward to more breakthrough research in areas such as regenerative fuel cells, multi-UAV operations through networking and routine access to the national airspace system that will allow UAVs to play an expanding role in Earth science and other types of missions.”

UAVs’ potential to help NOAA reach some of its objectives is not lost on officials of that agency.

“UAVs will allow us to see weather before it happens, detect toxins before we breathe them and discover harmful and costly algal blooms before the fish do – and there’s an urgency to more effectively address these issues,” said Vice Adm. Conrad C. Lautenbacher Jr., Undersecretary of Commerce for Oceans and Atmosphere and NOAA Administrator.

Developing cutting-edge technologies and transferring the knowledge to people and agencies that can use it is a primary goal of NASA’s Vehicle Systems program, a branch of the Aeronautics mission directorate.

“Demonstration of high-altitude, long-endurance aircraft work is one of the cornerstones of the new Vehicle Systems program,” said Richard Wlezien, Vehicle Systems program manager at NASA Headquarters.

“This is the one place where Aeronautics can give direct support to Exploration Systems and Earth Science missions. We also look forward to working with other agencies as we did with NOAA during the Altair missions. We believe there has to be something in between ground-based and space-based operations. This series of missions is the first step down that road.”

Dryden officials hope to see the Center play key roles in Vehicle Systems efforts, said Joel Sitz, Dryden UAV mission director.

“The recent Altair science mission demonstrations are a continuation of Dryden’s emerging role in helping the science community understand and discover how UAVs can be inserted into a global observation

system,” he said. “The vision will require the development of new UAV technologies and mission capabilities. At Dryden, we’re used to integrating systems into aircraft; now we’re looking at inserting aircraft into systems.”

The Altair, a high-altitude civil derivative of General Atomics’ Predator B military UAV, was designed for scientific and commercial research missions. With an 86-foot wingspan, it can reach altitudes up to 52,000 feet and remain airborne for more than 30 hours.

“Altair has proven its ability to perform long-endurance, high-altitude scientific missions in controlled airspace for NASA, and we look forward to continuing to demonstrate the strength of government agency-industry collaborations by adding NOAA as our new partner,” said Thomas J. Cassidy Jr., president and chief executive officer of General Atomics Aeronautical Systems.

Partners on the mission also included NASA’s suborbital program office of the Science mission directorate; sensor support for NOAA’s coastal monitoring and survey elements was provided by the NASA Aero Science ER-2 sensor technical staff. Real-time, Internet-based flight-progress tracking was provided by an Earth Science Capabilities Demonstration project, the Over the Horizon Telepresence and Networking Team, in conjunction with NASA’s Marshall Space Flight Center, Huntsville, Ala.



## Fullerton ... from page 1

Fullerton logged more than 382 hours in space flight as a NASA astronaut from September 1969 until November 1986, when he retired from the astronaut corps and joined Dryden's staff of research pilots. As an astronaut, Fullerton served on the support crews for the Apollo 14, 15, 16 and 17 lunar missions at Johnson Space Center, Houston.

In 1977, Fullerton was assigned to one of two two-man flight crews that piloted the Space Shuttle prototype Enterprise during the Approach and Landing Test program at Dryden.

Fullerton piloted the eight-day STS-3 Space Shuttle orbital flight test mission March 22-30, 1982. On that mission, the orbiter Columbia was exposed to extremes in thermal stress and the 50-foot Remote Manipulator System, used to grapple and maneuver payloads to orbit, was tested. STS-3 landed at Northrup Strip, White Sands, N.M., because Edwards' Rogers Dry Lake was too wet after heavy seasonal rains.

Fullerton later commanded the STS-51F Spacelab 2 mission flown on the orbiter Challenger in 1985. This mission was the first pallet-only Spacelab mission and the first to make use of the Spacelab Instrument Pointing System. It carried 13 major experiments in the fields of astronomy, solar physics, ionospheric science and life science and a superfluid helium experiment. The eight-day mission ended with a landing at Edwards.

After earning Bachelor of Science and Master of Science degrees in mechanical engineering from the California Institute of Technology, Pasadena, Fullerton joined the U.S. Air Force in 1958, where he flew both fighters and bombers. He attended the Air Force Aerospace Research Pilot School (now the Air Force Test Pilot School) at Edwards in 1964 and served as a test pilot with the Bomber Operations Division at Wright-Patterson Air Force Base, Ohio. In 1966, Fullerton was selected to serve as a member of the flight crew for the Air Force Manned Orbiting Laboratory program until its termination in 1969. He completed a 30-year military career, retiring as a colonel in 1988.

At Dryden Fullerton continues work as a civilian research pilot, and currently is chief of the flight crew branch. With more than 15,000 hours of flying time, Fullerton has piloted 135 types of aircraft, including a wide range of civil, military and specialized research aircraft. He has been the project pilot on a number of major flight research programs at Dryden.

To be eligible for induction into the U.S. Astronaut Hall of Fame, candidates must be a U.S. citizen, have been out of the active astronaut corps at least five years, have made his or her first flight at least 20 years prior to the induction year, be NASA-trained and have orbited the Earth at least once. Committee members consider not only accomplishments in space but also candidates' contributions to the advancement of space exploration both before and after their missions. For more information about the Astronaut Scholarship Foundation, visit <http://www.AstronautScholarship.org>.

Information about the 2005 Hall of Fame inductees may be found at <http://kennedyspacecenter.com>.



EC98 44749-27

NASA Photo

*Dryden Chief Pilot C. Gordon Fullerton was inducted April 30 into the Astronaut Hall of Fame. As an astronaut, Fullerton flew two Space Shuttle missions. He piloted Columbia on STS-3 in March 1982 and was Challenger's commander for STS-51F. He also is accomplished as a research pilot. Among other projects in which he played key roles, he was one of two NASA research pilots to evaluate the handling qualities of the Tu-144LL supersonic flying laboratory for NASA's High Speed Research Program in 1998. He is pictured above at the controls of the Tu-144LL.*



ECN 892

NASA Photo

*Fullerton was a key player in the 1977 Approach and Landing Tests, a series of five research missions with the Space Shuttle Prototype Enterprise. The series made important contributions to validating instrumentation, aerodynamics and control systems. The subsonic-to-landing research proved the Shuttle's integrated systems and fly-by-wire controls, and provided valuable experience for pilots. Above, the NASA 747 releases Enterprise for its first flight without the tail cone.*



EC02 0102-1

NASA Photo by Jim Ross

*Fullerton is at home behind the stick of a wide variety of NASA aircraft.*

### Dryden in brief

## Activities on tap for employees

The Dryden Exchange Council is sponsoring the following activities:

July 23 - A bus trip to the Hollywood Bowl for an evening of Tchaikovsky, featuring 1994 Tchaikovsky International Competition Winner Jennifer Koh as soloist for the Violin Concerto in D. The concert will end with the 1812 Overture featuring a fireworks display. Tickets are \$18 and \$28, and buses will depart Lancaster at 6:30 p.m.

Aug. 19 - Lancaster JetHawks Aerospace Appreciation Night. The JetHawks play the Bakersfield Blaze. Special features of the evening include a Bobble Head doll giveaway, post-game fireworks and an appearance by former Dryden pilot and astronaut Vance Brand. Tickets are \$5 and go on sale July 21.

Pizza nights, at Round Table Pizza in Lancaster, also are being planned for August. Cost for each event is \$10 per person, and includes one large two-topping pizza and choice of four sodas, one pitcher of beer or one carafe of wine.

Tickets and information for all events may be obtained by calling the Dryden Gift Shop, ext. 2113, or Jessica Lux-Baumann, ext. 3820.

## New system installed



EC05 0084-01

NASA Photo by Tony Landis

*The Office of the Chief Financial Officer recently completed upgrades to its Treasury Department payment system with the help of a few U.S. Treasury Department installation representatives. The secure payment system receiving the upgrade is used for payment transmittals from the government to vendors. Members of the installation team, from left, are Debbie Koebler, Lori Davey (seated), James Prial (U.S. Treasury Department), Eric Huffmaster, Nadine Cooper, Juan Navarro (Treasury Department), Vickie Moore, Sheryl Dylewsky (partially bidden) and Lydia Dorfman.*

## Scholarship honors memory of McCarthy

Antelope Valley College has established a scholarship in memory of Dr. Marianne McCarthy, former Dryden education program manager.

McCarthy died in October 2003.

McCarthy was instrumental in establishing the FIRST – For Inspiration and Recognition of Science and Technology – robotics program at Lancaster High School in 1999. FIRST robotics, an annual, international science competition sponsored by an industry-academia consortium, has since expanded to Tehachapi, Highland and Mojave high schools. In association with California State University, Los Angeles, she also developed the Science Ambassador Project through which elementary and middle school teachers enrolled in a Master of Science program at CSULA with the intent of using NASA educational support to stimulate minority children's interest in science and technology.

The Dr. Marianne McCarthy Scholarship in Education will support students aspiring to become a teacher of mathematics or science in kindergarten through eighth grade. The scholarship will be awarded annually to an AVC student to provide funds for the transfer and completion of a baccalaureate degree and a teaching credential at California State University, Bakersfield's AVC campus.

For information about donating to the scholarship fund, contact Bridget Razo, director of the Antelope Valley College Foundation, (661) 722-6313.



# Super Guppy makes brief appearance

By Peter Merlin

Dryden History Office

It attracts attention everywhere it goes, and probably inspires no small number of UFO sightings. The bizarre-looking Super Guppy cargo transport, the last of its kind, made a low and slow journey from Houston, Texas, to Edwards Air Force Base April 14 for landing gear maintenance at Dryden.

"The gear had to be completely changed out," said Dryden maintenance technician De Garcia of DynCorp. "It's routine maintenance," he said, on a plane whose profile is anything but routine.

Various versions of the outsize Guppy transports, built by the now-defunct Aero Spacelines Inc. of Santa Barbara, Calif., have been used at NASA since the days of the Apollo program. It's a unique airplane, built to transport such bay-busting cargo as satellites, rocket stages and jumbo-jet fuselage assemblies.

The Super Guppy is based at Ellington Field near Houston and assigned to Johnson Space Center. DynCorp personnel are responsible for maintaining the unusual craft that is made, in part, from technology dating to the Second World War. Guppy transports were built using parts of Boeing Model 377 and C-97 Stratocruisers, passenger and cargo aircraft based on the B-29 Superfortress bomber of World War II fame. Parts from the third prototype Stratocruiser, built in 1948, were used in the first Guppy and eventually were incorporated into NASA's airplane. Not surprisingly, the bulbous craft has unique maintenance requirements.

"We needed to jack it up indoors," said Garcia, "and Dryden has the only hangar big enough for the job." Work on the airplane took place in Hangar 1623. Originally built to house the Lockheed C-5 Galaxy, then the largest cargo plane in the world, the hangar now shelters NASA's DC-8 and ER-2 aircraft.

Beginning in 1962, ASI built and operated several Guppy variants: the 377PG Pregnant Guppy, 377MG Mini Guppy, 377SG Super Guppy, 377MGT (Mini Guppy Turbine, or Guppy 101) and the 377SGT (also known as the Super Guppy Turbine, or Guppy 201).

The Guppy 101 crashed during FAA certification tests at Edwards on May 12, 1970. The first 377SGT Super Guppy (N211AS) made its maiden flight on August 24 of the same year. Soon after, ASI suffered financial troubles and eventually, the 377PG and 377MG were sold to American Jet Corp. in Van Nuys, Calif. NASA subsequently acquired the 377SG. ASI's board of



EC05 0091-78

NASA Photo by Tony Landis

After replacement of its landing gear, NASA's Super Guppy turbine cargo plane departs Dryden, above, for a return trip to Johnson Space Center in Texas. Below, Dryden flight technician De Garcia tests equipment performance on the Super Guppy.



EC05 0091-12

NASA Photo by Tony Landis

directors decided to sell the 377SGT to France's Airbus Industrie.

Airbus committed to purchase of one aircraft in 1970, with a contractual commitment for ASI to build a second. After the second was delivered Airbus ordered two more Super Guppy models. Super Guppy No. 3 flew in 1979 and No. 4 in 1980. The four turbine-powered Super Guppy aircraft became a vital part of Airbus Industrie's production process, operating a regularly scheduled route five days

a week. The No. 4 aircraft was later used by the European Space Agency to transport space hardware.

In 1997, NASA acquired Super Guppy No. 4 (French registration F-GEAI) from ESA under an International Space Station barter agreement. The ESA supplied the Guppy to offset the cost to NASA of carrying ESA experimental equipment to the International Space Station as part of two future Space Shuttle flights. NASA's newest Super Guppy crew spent four weeks in

France getting checked out on flight procedures.

On October 23, 1997, the airplane (now registered as N941NA) landed at Ellington Field, near Houston. It replaced NASA's 377SG (N940NA), an older model of the Super Guppy, which was retired and is currently on display at Pima Air Museum in Tucson, Ariz. N941NA is the only Guppy still flying.

To create the 377SGT, ASI technicians built an entirely new fuselage to connect parts taken from a Stratocruiser, including the nose section and pressurized cockpit, wings, lower sections of engine nacelles, parts of the tail surfaces and the main landing gear. The nose wheel came from a Boeing 707, but it was rotated 180 degrees prior to installation. A 23-foot center section was inserted into the wing to give additional clearance between the propeller tips and the fuselage. The air-conditioned forward cabin features seating for three crew and four passengers.

The 377SGT is equipped with Allison T-56-501-D22C turboprop engines that give the Super Guppy an airspeed of around 200 knots at low altitudes. At higher altitudes the aircraft is limited to 185 knots. ASI took engine cowlings of the type used on Lockheed Electra/P-3 Orion airplanes, but used propellers and spinners from a C-130 Hercules.

**See Guppy, page 15**

**May 3, 1948** – D-558-I (37971) crashed on takeoff due to compressor disintegration. Howard Lilly became the first NACA pilot to die in the line of duty.

**May 12, 1950** – RKO Pictures filmed a launch of Maj. Charles "Chuck" Yeager in the X-1-1 (46-062) for the motion picture Jet Pilot. It was the last flight of 46-062, which was then retired and placed on display in the Smithsonian Institution's Air and Space Museum in Washington, D.C.

**May 6, 1960** – A U-2A (56-6711) from Edwards North Base was brought to the NASA Flight Research Center and



painted in fictitious NASA markings with a bogus tail number (55741). News media representatives were allowed to photograph the aircraft to support the government-supplied cover story that Francis Gary Powers, who had been shot down over Russia in a U-2 on May 1, was on a NASA research flight.

**May 2, 1962** – X-15 (56-6672) was transported to Eglin Air Force Base, Fla., beneath NB-52A (52-0003) for display at a presidential visit. The captive flight and return were dubbed Project Eglin 1-62.

**May 21, 1962** – During an inspection of Delamar Dry Lake, Nev., by Neil Armstrong, JF-104A (56-0749) suffered damage to its ventral fin and landing gear doors. Armstrong made an emergency landing at Nellis Air Force Base, Nev. Milt Thompson went to pick him up in F-104B (57-1303), but blew a tire on landing. Bill Dana picked Armstrong up in T-33A (58-0692). Thompson returned to Edwards in a visiting C-47.

**May 8, 1963** – C-140 JetStar (N814NA) was delivered to the NASA FRC.

**May 25, 1969** – F-8A (141353) was delivered to the NASA FRC for the Supercritical Wing program.

**May 5, 1974** – John A. Manke flew the first supersonic X-24B flight, achieving a speed of Mach 1.086 (708 mph).

**May 22, 1975** – Jacques Yves Cousteau visited the NASA FRC, and watched John Manke land the X-24B on the lakebed. Cousteau was allowed to greet Manke on the lakebed, after touchdown. Manke exited the aircraft wearing diving flippers.



# Practice makes perfect

## Dryden, Air Force prepare for Shuttle contingencies

By **Leslie Williams**  
Public Affairs Specialist

Personnel from Dryden and Edwards Air Force Base conducted a training exercise recently that would enable them to effectively handle the rescue of a Space Shuttle crew in the unlikely event of a landing mishap at the base.

The exercise was designed to train fire/rescue and medical crews in aiding the Shuttle crew in exiting the Shuttle after a simulated landing mishap on or near the Edwards runway and escaping from the mishap area. The exercises are held periodically to familiarize new personnel with Shuttle landing and crew rescue procedures and to acquaint the rescue team with new Shuttle recovery equipment designed to cool and purge the orbiter within an hour of touchdown.

The Shuttle Discovery is targeted for liftoff on mission STS-114 to the International Space Station this summer from NASA's Kennedy Space Center in Florida. Although Kennedy is also the primary landing site for Space Shuttle missions, Edwards remains the alternate landing site in case weather or other situations preclude a landing in Florida.



EC05 0079-32

NASA Photo by Tony Landis

## Legacy

... from page 4

a demanding schedule, he was recognized for creating a highly efficient test plan to acquire all the requested data.

Bryant later served as NASA project manager for two joint U.S.-U.K. research activities involving remotely piloted scale models. First, in 1981, he coordinated NASA support of the Cooperative High-Incidence Research Program, or CHIRP. The success of CHIRP led to two High-Incidence Research Model projects in 1983 and 1986.

He also served as project manager for the F-4C Spanwise Blowing project in 1983 and the Daedalus human-powered aircraft project in 1987.

Over the course of his career, Bryant received group achievement awards for participation in the following programs:

- X-15 Research Airplane Flight Test Organization
- Lightweight Fighter Test Team
- B-52 Operations Team
- Solid Rocket Booster Deceleration Subsystem Development Air Drop Test Team
- Thermal Protection System Test Team
- B-52 Wing Pylon Proof Load Team
- Dryden Basic Operations Manual Development Team
- Pegasus Launch Team
- B-52/Space Shuttle Orbiter Drag Chute Flight Test Team

Bryant retired from Dryden April 1. He is survived by his wife, Elouise, and two sons, Jeffrey, of Las Vegas, Nev., and Joel, of Lancaster.

At the time of his retirement, Bryant was the last former NACA employee still working as a civil servant at Dryden. His distinguished NASA career was book-ended by the first X-15 flight in 1959 and the last X-43A flight in 2004, spanning more than 40 years of hypersonic flight research at Dryden.



NASA Photo

## Remembered

... from page 4

craft back and compete for potential F-18 work.

“The project was given to Roy Bryant for execution. What pressure! But Roy was unperturbed. He never appeared concerned by the enormity of the political consequences of even the slightest misstep. When it came time to present our master flight test plan to the very anxious Northrop management structure, Roy pulled out a manila folder with every test point laid out based on the energy required to reach the test point. That meant that he planned the tests so that the pilot could get a low-and-fast test point, then zoom to altitude to get a high-altitude/high-angle-of-attack test point. It was the most efficient way to get all the incompatible test points he was given.

“The plan blew them away. All Roy ever said at the end was, ‘I knew we could do it.’

“That was Roy Bryant.”

“Roy was a tremendous support to the Shuttle program with the B-52 Drag Chute test and all the other things he did to help Dryden employees,” said Joe D’Agostino, Dryden Space Shuttle manager, adding that Bryant was key in helping D’Agostino earn a promotion in the Air Force Reserve and achieve the rank of a full colonel.

“Roy played a tremendous part in that. Because he was an Army instructor, he was able to allow me to take a whole bunch of Army courses. Roy was able to administer the tests and forward them to the appropriate people in the Department of the Army. By doing that, he allowed me to accomplish what I wanted to do in a very short period of time. That would not have been possible for me without Roy’s help.”

D’Agostino remembered Bryant as being generous with his time and always willing to share his knowledge with those who needed his assistance.

“Roy did little things behind the scenes that people just didn’t realize,” D’Agostino said. “He was a very, very good instructor. He took time with people, and would help people in other disciplines,” something another colleague, former research pilot Bill Dana, and others reflected on during memorial services for Bryant.

His one-on-one support of colleagues was “an important part of Roy in his life, and one that people didn’t realize,” added D’Agostino. “In addition to all his great accomplishments here at Dryden, it’s that reaching out to provide assistance in other areas that made Roy very, very special.”



EC05 0091-46 NASA Photo by Tony Landis

## Guppy

... from page 14

The P-3’s propellers are built for speed, whereas the C-130’s are built for high loads. The upper nacelles were constructed using parts from a P-3 and adapting the Lockheed cowls to the existing lower nacelles and landing gear housing.

While building the fourth 377SGT for Airbus, ASI found that there were no B377 or C-97 airframes left to cannibalize. They had all been scrapped. In desperation, ASI bought lower fuselage parts from the disassembled Pregnant Guppy and shipped them to France where they were incorporated into the 377SGT. Hence, the last Guppy built contains parts of the first Guppy, which included parts of one of the first Stratocruisers.

The airplane’s nose is hinged on the left side of the fuselage. The 377SGT is equipped with three built-in jacks, two in front of the wing and one behind. These jacks support and steady the airplane before the fuselage joint is unlocked, and the nose opened and wheeled out of the way.

A system of rails in the cargo compartment is used with either pallets or fixtures designed for specific cargo. An electric winch beneath the cargo bay floor moves pallets or fixtures on rail-mounted rollers. Automatic hydraulic lock pins in the rail secure the pallet for flight.

The cargo hold has a maximum interior diameter of 25 feet and overall length of just over 111 feet, with a constant 25-foot-diameter section 32 feet long. The 377SGT’s absolute volume is 49,750 cubic feet with a usable volume of 39,000 cubic feet.

After landing gear maintenance was complete, NASA’s big fish returned to Johnson May 4.

## Griffin ... from page 1

he will pay particular interest is restarting hypersonics research. The new administrator, the 11<sup>th</sup> to hold the position, said he was not in favor of seeing work with hypersonics end after the two successful X-43A missions completed in 2004. That research, conducted by a team from Langley Research Center and Dryden with key contributions from industry partners, is important for future exploration systems and beneficial to the nation for applications in military and advanced civil systems, Griffin said.

Some research areas are inherently risky, another issue Dryden employees asked the administrator to address.

"I have a very strong belief that public dollars for agencies of our type should be expended so that the nation has an entity which will operate on the frontier," Griffin responded. "Our frontier is aeronautics and space. The frontier is where we don't know what's out there. There is an appropriate balance. If it takes six miracles in series to make something work, we're not going to do that. We will take measured risks."

That's not to say NASA won't push the limits of these new frontiers, he added.

"We need to think it through but we can't continue to be risk-averse, as we have been. It comes down to our culture problems, which in some areas we need to fix. We have confused risk aversion with not tolerating dissenting opinions.

"If you are engaged in risky activities that include large amounts of money or lives, then you have to move forward with all the information you can. You're not going to have all the information you want. It should be part of our culture to get every opinion we can find. Not to the extreme, when people start repeating the same themes – we have to hear all the rational arguments."

Several employee questions focused on full-cost accounting, a financial tool that takes into account people, facilities and materials in charging for services NASA provides to other government agencies and private industry.

Griffin, who assumed the administrator's job in April, pledged to take facility costs out of the full-cost equation to help NASA centers offer competitive prices for their services. However, he also cautioned against confusing the effects of bad strategic planning with those of using a financial tool, one designed to provide the bottom line on what it costs NASA to provide services and to show where money goes.

"My accountant has nothing to say on where I spend my money," he



ED05-0111-2

NASA Photo by Tom Tschida

*New NASA Administrator Michael Griffin, at right, shares an observation with Director Kevin Petersen, left, and F-15B project manager Stephen Corda during Griffin's recent visit to Dryden. Griffin's March 11 presidential appointment to succeed Sean O'Keefe was confirmed by the U.S. Senate on April 14.*

offered as an analogy. "My CFO (chief financial officer) is not in doubt about what I want to do.

"Full-cost accounting is just a way of knowing what you spend, and who can be opposed to that? But it's not a budget tool. Accounting is accounting and budgeting is budgeting. Budgeting is making decisions about what I want to spend money on. We kid ourselves if we allow ourselves to blame full-cost accounting, which is a tool, for strategic management decisions not to do appropriate technology development."

Griffin called Dryden "an outstanding center" and made it clear that aeronautics will continue despite the current budget squeeze. In addition, he emphasized that there will be a role for Dryden in the Agency's future.

"We're at a low point in aeronautics right now, so hang on. We'll be doing some different things, and we'll be leaving some things behind that we used to do. Stick with me as we move into the future because NASA needs to be a vibrant agency. We'll be exploring the intellectual frontier," he said.

Other questions focused on how Dryden might fit into the space vision in general and more specifically into the work on the Crew Exploration Vehicle, or CEV, that is intended to lead to a replacement for the current Space Shuttle fleet.

In addition to management of research on the CEV heat shield and Dryden engineer Dan Banks' investigation of aerodynamic principles that could be used in the vehicle's design, Griffin said there also is

potential for other roles for Dryden.

"I'm sure that when we're ready to test approach and landing for whatever kind of CEV we have that it's almost a no-brainer that Dryden is the place to do it," he said. "I'm sure there will be other kinds of exploration work. I recall that they did the LLRV (Lunar Landing Research Vehicle) flights here during Apollo. There will be a role for Dryden."

Dryden engineers assisted in development of and led flight research with the LLRV trainers, which aided pilots in learning how to land the Lunar Excursion Module on the Moon's surface.

Responding to questions on competition among NASA centers for new business, Griffin said he is in favor of it when it can make a project better, but not in ways that could be detrimental.

As an example, he said several centers currently have concepts for a Mars aircraft. All are encouraged to develop the best aircraft possible, he said, the end result being a winning design while no center is penalized for a win or loss.

"There are places even in government where competition is good," he said.

Griffin said research centers should be exactly that – facilities where government work can be conducted that might not be profitable or have a long-term rate of return for the private sector, or where risky research that might benefit the nation can be carried out.

He also wants to see that NASA capabilities utilized by other government agencies are appropriate

to the NASA charter. Work taken on at the Agency, he said, must pertain to NASA's mission and not be work that the Agency can do, but is not tasked with doing.

"There are times one should get out of a business. I don't want to see us pursue work for the sake of keeping enterprises alive that should not survive. If the balance of work we do is for outside interests and does not fit into current NASA themes, we have to recognize that reality. The intellectual frontier always changes. We have an obligation to let go of the old and do the new," he said.

One example of a new role Dryden has begun to fill is supplying technology to the National Oceanic and Atmospheric Administration. A recent series of joint NASA-NOAA missions has reinforced that Dryden has the expertise to help end users customize UAVs for completing a variety of missions.

How NASA is stacking up against formidable aeronautics and space programs in China, Europe, Japan, Russia and other areas of the world was another assessment employees asked Griffin to give.

Some nations, he responded by saying, will be partners and allies on some endeavors and competitors on others. But the new administrator emphasized one point: "It is important to me personally – as I hope it is to you – that our aviation and space capability is second to none in the world. We should be the standard bearer for aviation and space in the world. I think it's strategically important to the world of tomorrow."

Griffin's remarks left no doubt as to where he wants to see NASA go.

"I want to see us become the predominant explorer. That's where I want us to be."

## War on Error ... from page 3

that it was a mistake to restrict such behavior through overly constraining procedures – a common approach to rote safety training.

Rather, Kern said those traits should be understood and harnessed as an effective technique for maximizing response under duress.

Training individuals' habits and developing intuition, he said, were among methods his company advocates for limiting human failure.

Additional information about Kern's program can be found at the company's Web site, <http://www.convergent-knowledge.com>.

The NASA X-Press is published for civil servants, contractors, retirees and people with interest in the work of the Dryden Flight Research Center.

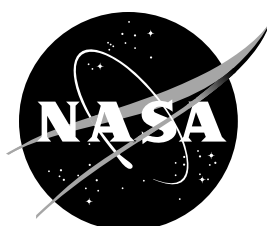
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